

WFIRST



***An extraordinary science investigation of new
worlds and new horizons***

WFIRST Preparatory Science Kickoff

2015-03-12

Dominic Benford

ASTROPHYSICS

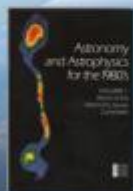
Decadal Survey Missions

1990



1972
Decadal
Survey
Hubble

1999



1982
Decadal
Survey
Chandra

2003



1991
Decadal
Survey
Spitzer

LRD: 2018

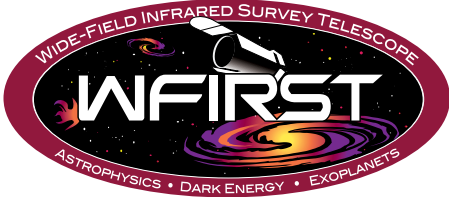


2001
Decadal
Survey
JWST

LRD: 2020s



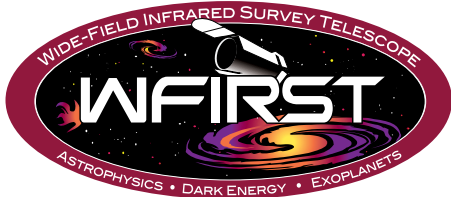
2010
Decadal
Survey
WFIRST



Pre-Formulation Emphasis



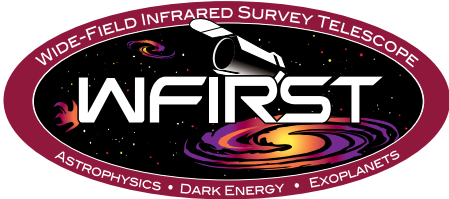
- WFIRST pre-formulation activities have been directed in three key areas from 2008-2015:
 - Developing and iterating a design reference mission in sufficient detail to:
 1. verify critical mission performance parameters;
 2. support a high-degree-of-confidence costing activity.
 - Maturing key technologies;
 1. Detectors
 2. Coronagraph
 - Developing well defined requirements from science



Design Reference Mission Status



- **WFIRST-AFTA Science Definition team completed a two-year study effort on 2/13/15**
- **Study office is starting Design Cycle 6 to evaluate alternate mission design options**
 - Alternate options include L2 vs. GEO orbit
 - Design Cycle 6 to finish in November 2015
- **WFIRST Preparatory Science investigations beginning in April.**



WFIRST Preparatory Science

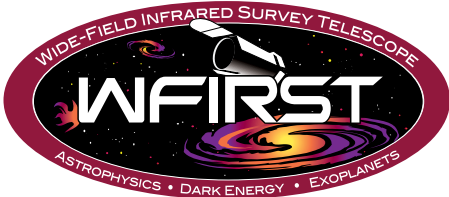


Strategy:

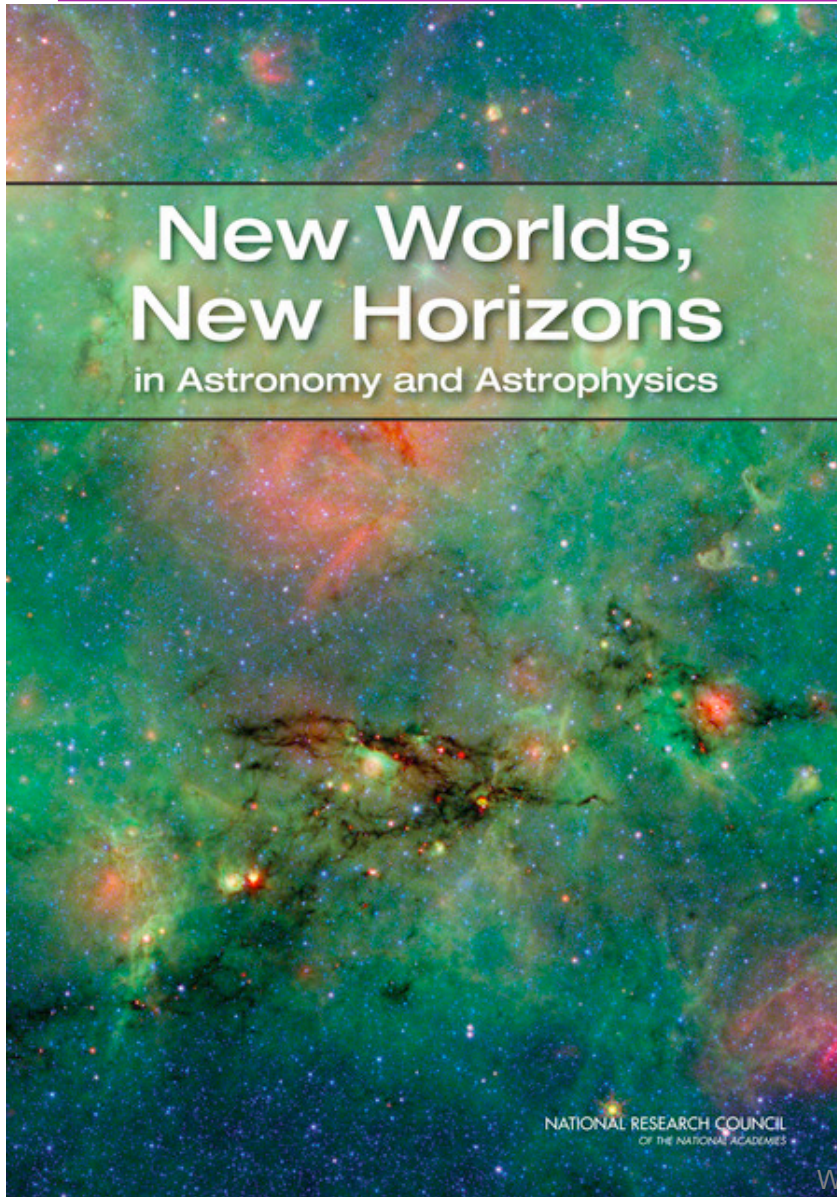
Engage much wider swath of the astronomical community into working on the science of WFIRST-AFTA.

Benefits:

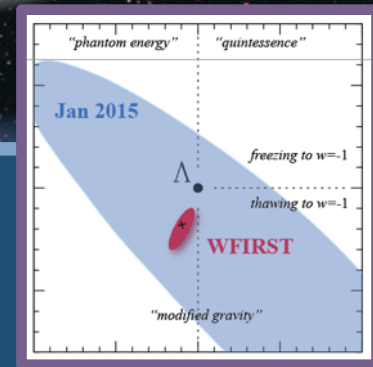
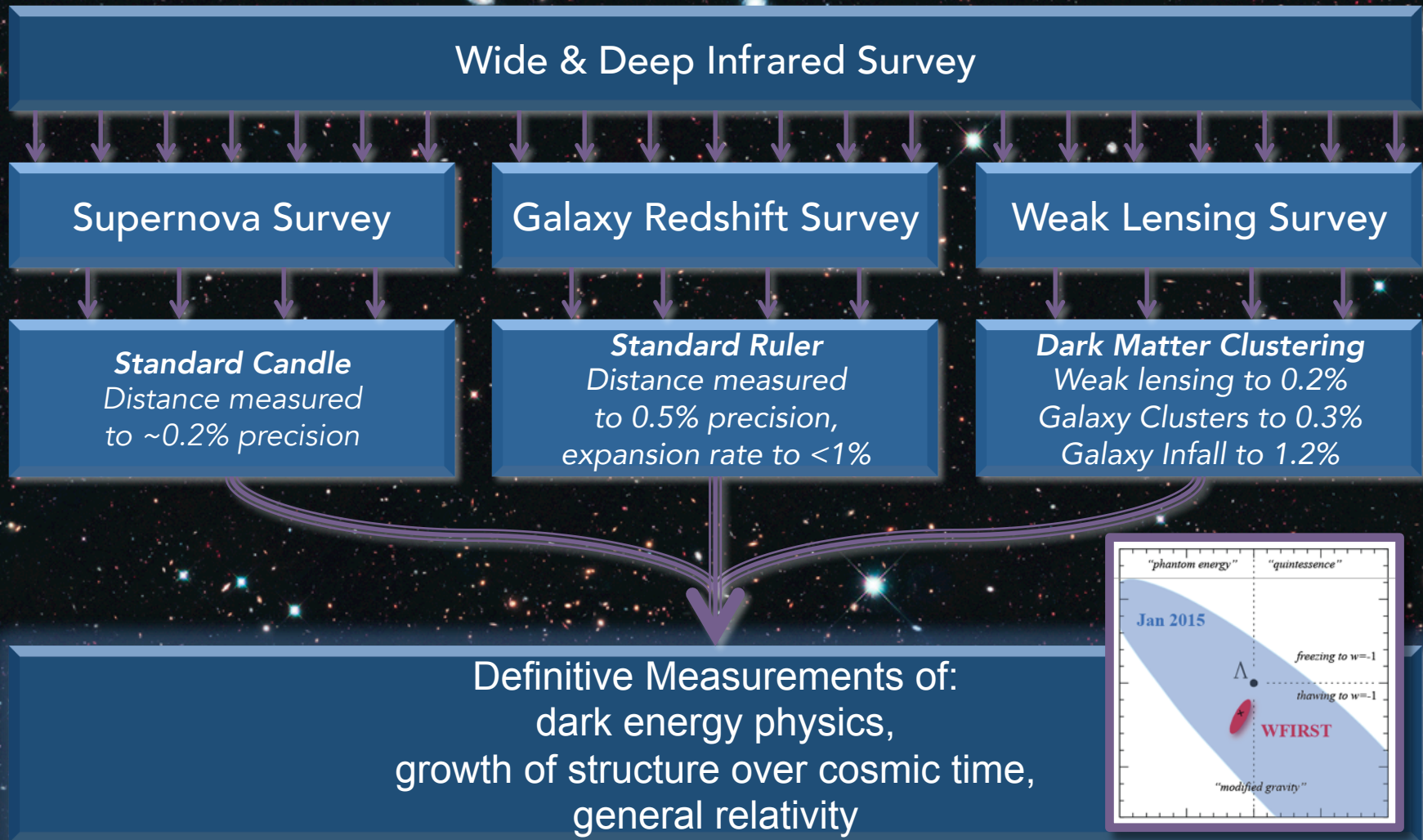
1. Yields richer understanding of WFIRST-AFTA science
2. Provides forecasts of WFIRST-AFTA results
3. Widens community thinking about WFIRST-AFTA science
4. Strengthens understanding of the mission implementation

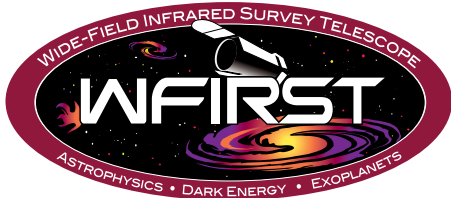


Decadal Survey for Astrophysics



- WFIRST is the top ranked large space mission in 2010 Decadal Survey for Astrophysics
- Extremely broad scientific impact
- Fulfills 10/20 key science questions!
- A definitive **dark energy experiment**
- A comprehensive **exoplanet census**
- A surpassing **infrared survey**
- A powerful **guest observer program**

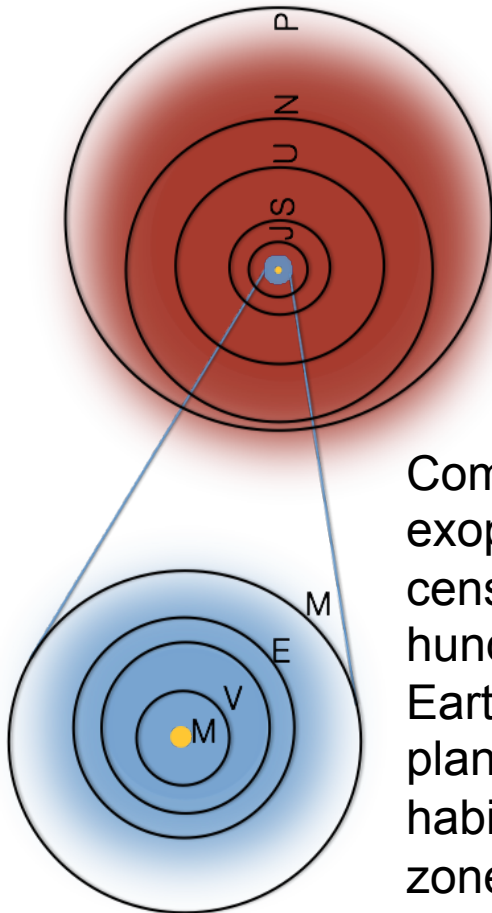




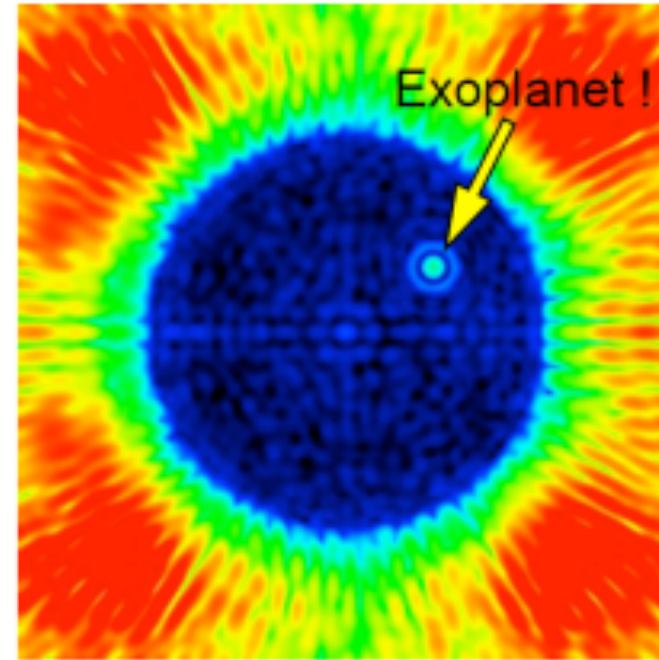
Exoplanet Science



WFIRST Search Area



Complete the exoplanet census: find hundreds of Earth-mass planets in the habitable zone!



Direct imaging & spectroscopy via coronagraph: characterize exoplanets to study the variety of atmospheres and understand environment & habitability

Kepler Search Area

Microlensing Survey

Coronagraph

<http://planetquest.jpl.nasa.gov/video/61>